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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
STAICOVICI, STEFAN

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 02/28/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/689,131	HETZEL,, JOHN M.	
	Examiner	Art Unit	
	Stefan Staicovici	1732	

-- Th MAILING DATE of this communication appears on the c ver sheet with the c rrespondence address --

Peri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *1-59* is/are pending in the application.

4a) Of the above claim(s) *38-41 and 59* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37 and 42-58* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed December 11, 2002 (Paper No. 8) has been entered. Claims 1, 17, 23, 36 and 42 have been amended. No claims have been canceled. New claims 56-59 have been added.

Election/Restrictions

2. Applicant's election without traverse of Group I in Paper No. 8 is acknowledged.

Newly submitted claim 59 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claims 59 is drawn to a protective helmet classified in class 428, subclass 34.1.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 59 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 8, 11, 17, 42, 49, 52 and 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230).

Medwell ('674) teaches the basic claimed process of forming a protective helmet including, providing a thermosetting resin impregnated fabric (fiber-based filler), positioning said thermosetting resin impregnated fabric into a mold having a male and a female mold half and molding said thermosetting resin impregnated fabric into a protective helmet under heat and pressure by curing said thermosetting resin (see col. 2, line 65 through col. 3, line 14).

Regarding claims 1, 17 and 42, Medwell ('674) do not teach a thermosetting resin impregnated fabric having ceramic particles mixed therein. JP 1-145106 teach a process for molding a ceramic sheet including, mixing ceramic particles with a thermosetting resin, impregnating a fibrous sheet with said mixture and molding said impregnated fibrous sheet under heat and pressure. Fujino *et al.* ('230) teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation (see col. 1, lines 5-15 and col. 3, lines 23-28). Therefore, in view of Fujino *et al.* ('230) it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by JP 1-145106 in the process of Medwell ('674) because, Fujino et al. ('230) specifically teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation, hence improving the protective characteristics of the resulting molded helmet.

In regard to claims 8 and 49, Medwell ('674) teaches a polyester thermosetting resin (see col. 3, lines 9-14).

Specifically regarding claims 11 and 52, Medwell ('674) teaches polyaramid fibers (see col. 3, lines 5-9).

Regarding claims 56-57, it is submitted that after curing, said thermosetting resin is rigid. Further, it is submitted that the protective helmet Medwell ('674) meets the NFP Standards in order to function as described.

5. Claims 9-10 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and Hetzel, Jr. *et al.* (US Patent No. 6,098,197197).

Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 9 and 50, Medwell ('674) in view of JP 1-145106 do not teach a vinyl ester thermosetting resin. Hetzel, Jr. *et al.* ('197) a process for making a protective helmet including, providing a male (26) and a female (28) mold, positioning a fiber reinforced sheet (16) in said female mold (28), pouring a thermosetting resin (18) onto said fiber reinforced sheet (16), closing said male mold onto said female mold and curing under heat and pressure said resin to form a protective helmet (see col. 6, lines 41-60 and Figure 6). Further, Hetzel, Jr. *et al.* ('197) teach that polyester and vinyl ester are equivalent alternatives for molding a protective helmet (see col. 3, lines 9-14). Therefore, it would have been obvious for one of ordinary skill in the art

to have provided a vinyl ester thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

In regard to claims 10 and 51, Hetzel, Jr. *et al.* ('197) teach that a vinyl ester thermosetting resin includes a catalyst, hence it is submitted that said catalyst was applied prior to impregnating said fibrous sheet with said thermosetting resin (see col. 6, lines 44-46). Therefore, it would have been obvious for one of ordinary skill in the art to have added a catalyst vinyl ester to a thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

6. Claims 12-13, 15 and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and Hastings (US Patent No. 5,794,271).

Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 12-13, 15 and 53-55, although Medwell ('674) teaches providing additional reinforcement layers (see col. 2, lines 60-65), Medwell ('674) does not specifically teach a fiber-based sheeting, especially a woven/non-woven glass fiber sheeting. Hastings ('271) teaches a polymeric protective helmet including, providing a non-woven glass fiber layer (32)

(see col. 3, lines 6-20 and Figure 3). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a fiber-based sheeting, especially a non-woven glass fiber sheeting as taught by Hastings ('271) in the protective helmet formed by the process of Medwell ('674) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) because, Hastings ('271) specifically teaches that such a sheeting provides for improved impact resistance, Medwell ('674) and Hastings ('271) teach similar end-products.

7. Claims 1, 5, 8, 11-13, 15, 17-19, 23, 27, 33-36, 42, 46, 49 and 52-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230).

Hastings ('271) teaches the basic claimed process of forming a protective helmet including providing a first layer of thermosetting resin (18) on a mold surface, placing a second layer including a fiber reinforced woven fabric (20) over said first layer of thermosetting resin (18), positioning a third layer of said thermosetting resin (22) and molding (curing thermosetting resin) said layers to form said protective helmet (see col. 2, lines 38-65). It is submitted that since Hastings ('271) teaches a molding process that a female and a male mold are taught in order to obtain a molded article as shown in Figure 1.

Regarding claims 1, 17, 23, 36 and 42, Hastings ('271) does not teach a thermosetting resin impregnated fabric having ceramic particles mixed therein. JP 1-145106 teach a process for molding a ceramic sheet including, mixing ceramic particles with a thermosetting resin, impregnating a fibrous sheet with said mixture and molding said impregnated fibrous sheet under heat and pressure. Fujino *et al.* ('230) teach that a high polymer mixed with ceramic mixture

provides increased protection from infrared radiation (see col. 1, lines 5-15 and col. 3, lines 23-28). Therefore, in view of Fujino *et al.* ('230) it would have been obvious for one of ordinary skill in the art to have provided a thermosetting resin impregnated fabric having ceramic particles mixed therein as taught by JP 1-145106 in the process of Medwell ('674) because, Fujino et al. ('230) specifically teach that a high polymer mixed with ceramic mixture provides increased protection from infrared radiation, hence improving the protective characteristics of the resulting molded helmet.

Further regarding claims 18-19, 23 and 36, it should be noted that Hastings ('271) teaches a first thermosetting resin layer (18), a fiber layer (20) and a second thermosetting layer (22) placed onto said fiber layer (20).

In regard to claims 5, 27 and 46, Hastings ('271) teaches that the epoxy layer penetrates second layer (20) to completely saturate said second layer (20) (see col. 2, line 66 through col. 3, line 5). Further, upon curing, it is submitted that "complete saturation" requires that the epoxy resin flow around the fibers and bond to the fibers during the curing process.

In regard to claims 8 and 49, Hastings ('271) teaches an epoxy thermosetting resin (see col. 2, lines 41-42).

Specifically regarding claims 11 and 52, Hastings ('271) teaches aramid fibers (see col. 2, lines 50-51).

Regarding claims 12-13, 15, 33-35 and 53-55, Hastings ('271) teaches a polymeric protective helmet having a non-woven glass fiber layer (32) bonded to woven fiber layer (20) (see col. 3, lines 6-20 and Figure 3).

In regard to claim 16, Hastings ('271) teaches placing a fiber layer (20) onto a first resin layer (18) and then placing a second resin layer (22) onto said fiber layer (20). Hence, it is submitted that said fiber layer (20) is positioned in the mold prior to resin impregnation.

Regarding claims 56-57, it is submitted that after curing, said thermosetting resin is rigid. Further, it is submitted that the protective helmet Medwell ('674) meets the NFP Standards in order to function as described.

8. Claims 2, 20, 24, 37 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and JP 55-3320.

Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 2, 20, 24, 37 and 43, Hastings ('271)in view of JP 1-145106 and in further view of Fujino *et al.* ('230) do not teach chopping the ceramic particles. JP 55-3320 teaches forming ceramic particles by grinding (chopping) a ceramic blank. Therefore, it would have been obvious for one of ordinary skill in the art to have formed ceramic particles by grinding (chopping) a blank as taught by JP 55-3320 in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) because, JP 55-3320specifically teaches forming ceramic particles by grinding, whereas JP 1-145106 teaches a process for impregnating a fabric with a mixture containing ceramic particles and thermosetting resin. Further, it should be noted that Fujino *et al.* ('230) specifically teach that a high polymer mixed with ceramic mixture

provides increased protection from infrared radiation (see col. 1, lines 5-15 and col. 3, lines 23-28).

9. Claims 3-4, 44-45 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and JP 11-322459.

Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 4 and 45, Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) do not teach a ceramic content of 10 to 20 percent by weight. JP 11-322459 teaches a moldable mixture of thermosetting resin and ceramic particles in a content of 5-30 percent by volume (approximately 10 to approximately 20 percent by weight). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a moldable thermosetting resin and ceramic particles in a content of 5-30 percent by volume as taught by JP 11-322459 in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) because, JP 1-145106 specifically teaches a moldable mixture of thermosetting resin and ceramic particles. Further, it should be noted that the ceramic content is a result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) and JP 1-145106 due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

In regard to claims 3, 44 and 58, it is submitted that particle size is are result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further view of JP 1-145106 due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

10. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230), JP 55-3320 and JP 11-322459.

Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) and JP 55-3320 teach the basic claimed process as described above.

Regarding claim 26, Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) and JP 55-3320 do not teach a ceramic content of 10 to 20 percent by weight. JP 11-322459 teaches a moldable mixture of thermosetting resin and ceramic particles in a content of 5-30 percent by volume (approximately 10 to approximately 20 percent by weight). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a moldable thermosetting resin and ceramic particles in a content of 5-30 percent by volume as taught by JP 11-322459 in the process of Hastings ('271) in view of JP 1-145106 and in further view of JP 55-3320 because, JP 1-145106 specifically teaches a moldable mixture of thermosetting resin and ceramic particles. Further, it should be noted that the ceramic content is a result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it

would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), JP 55-3320 and JP 11-322459, due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

In regard to claim 25, it is submitted that particle size is are result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum ceramic particle size in the process of Hastings ('271) in view of JP 1-145106 and in further view of JP 55-3320 and JP 11-322459 due to a variety of unclaimed parameters such as thermosetting resin type, final desirable characteristics, etc.

11. Claims 6-7, 9-10, 14, 28-30, 32, 47-48, 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 1-145106 and in further view of Fujino *et al.* (US Patent No. 5,630,230) and Hetzel, Jr. *et al.* (US Patent No. 6,098,197197).

Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) teach the basic claimed process as described above.

Regarding claims 9, 31 and 50, Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) do not teach a vinyl ester thermosetting resin. Hetzel, Jr. *et al.* ('197) a process for making a protective helmet including, providing a male (26) and a female (28) mold, positioning a fiber reinforced sheet (16) in said female mold (28), pouring a thermosetting resin (18) onto said fiber reinforced sheet (16), closing said male mold onto said female mold

and curing under heat and pressure said resin to form a protective helmet (see col. 6, lines 41-60 and Figure 6). Further, Hetzel, Jr. *et al.* ('197) teach that polyester and vinyl ester are equivalent alternatives for molding a protective helmet (see col. 3, lines 9-14). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a vinyl ester thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

In regard to claims 10, 30, 32 and 51, Hetzel, Jr. *et al.* ('197) teach that a vinyl ester thermosetting resin includes a catalyst, hence it is submitted that said catalyst was applied prior to impregnating said fibrous sheet with said thermosetting resin (see col. 6, lines 44-46). Therefore, it would have been obvious for one of ordinary skill in the art to have added a catalyst vinyl ester to a thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet. Further regarding claim 30, it should be noted that Hastings ('271) teaches an epoxy thermosetting resin (see col. 2, lines 41-42). It should be noted that in claim 32, it is submitted that the catalyst is mixed with the thermosetting resin prior to being molded in order to allow homogeneous distribution of said catalyst within said thermosetting resin and as such to function as described by Hetzel, Jr. *et al.* ('197).

Specifically regarding claim 14, Hetzel, Jr. *et al.* ('197) teach a firefighter helmet having a thickness of 0.08 inches (approximately 0.09 inches) (col. 5, line 37). It would have been obvious for one of ordinary skill to have provided a fibrous layer having a thickness of approximately 0.09 inches (0.08 inches) as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230), because Hetzel, Jr. *et al.* ('197) specifically teach that such a thickness is desirable for a protective helmet which is taught by Hastings ('271).

Regarding claims 6-7, 28-29, 47-48, it is submitted that molding time, temperature and pressure are result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Further, it should be noted that Hetzel, Jr. *et al.* ('197) teach a molding temperature of 100 to 200 °F, a molding pressure of 300 to 500 psi and a molding time of 6-9 minutes (see col. 6, lines 57-68). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum molding temperature, pressure and time as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 1-145106 and in further view of Fujino *et al.* ('230) because, Hetzel, Jr. *et al.* ('197) teach molding (curing) conditions for an epoxy thermosetting resin which is the material taught by Hastings ('271).

Response to Arguments

12. Applicant's remarks filed December 11, 2002 (Paper No. 8) have been considered, but are moot in view of the new ground(s) of rejection.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (703) 305-0396. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM and alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard D. Crispino, can be reached at (703) 308-3853. The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Stefan Staicovici, PhD

Primary Examiner 2/24/03

AU 1732

February 24, 2003